



DEPARTMENT OF PLANNING AND BUILDING COMMERCIAL BUILDING CHECKLIST

City staff has compiled this partial checklist to assist developers with designing buildings in conformance with the present edition of the Building Code. The City of Long Beach assumes no liability or responsibility for the accuracy or completeness of information presented herein. Please note: Numbers in the brackets are in reference to sections of the 2001 CBC.

BUILDING OCCUPANCY AND AREA

1. Exterior walls shall have fire resistance and opening protection as set forth in Table 5-A and additional provisions set forth in Chapter 6 [503.2.1].
2. Openings in exterior walls are required to be protected due to distance from property lines, the sum of the area of these openings shall be limited to 50% of the area of the exterior wall in each story [503.2.2].
3. Occupancy separations shall be provided between the various groups and divisions of occupancies as set forth in Table 3-B [302.1, 302.4].
4. Where the occupancy separation is horizontal, structural members supporting the separation shall be protected by equivalent fire-resistive construction [302.2].
5. Rooms containing a boiler, central heating plant or hot-water supply boiler shall be separated from the rest of the building by not less than a one-hour occupancy separation [302.5].
6. For the purpose of area limitation, limitation on the number of stories and type of construction, a basement or first story may be considered as a separate and distinct building if the following conditions are met [311.2.2.1]:
 - a. The basement or first story is of Type I construction and is used exclusively for parking.
 - b. The basement or first story is separated from the building above with a three-hour occupancy separation.
 - c. The portion of the building above the three-hour occupancy separation contains A-3, B, M or R-1 Occupancies only.
 - d. The maximum building height shall not exceed the limits set forth in Table 5-B for the least type of construction.
7. The area of a building housing more than one occupancy shall be such that the sum of the ratios of the actual area (for each occupancy) divided by the total allowable area does not exceed one [504.3].
8. Area separation walls shall extend to the outer edges of horizontal projections such as balconies, roof overhangs, canopies or other architectural projections [504.6.3].
9. Unless the roof is of two-hour construction, area separation walls shall extend from the foundation to a point at least 30" above the roof [504.6.4].
10. The total width of all openings in an area separation wall shall not exceed 25% of the length of the wall in each story [504.6.2].
11. Wall rating and opening protection of buildings on the same property and court walls of buildings over one story in height shall be determined based on an assumed property line between them [503.3].

ARCHITECTURAL PLANS (GENERAL)

1. Provide the following with each set of plans:
 - a. Complete site plan showing yard set backs, easements, lot dimensions, distance between buildings, size of building, etc.
 - b. Fully dimensioned floor plan of each level.
 - c. Roof plan.
 - d. Foundation plan.
 - e. Construction sections.
 - f. Building elevations. Show floor and top of roof elevations, natural and finished grade around the perimeter of the building.
 - g. Architectural details.
 - h. Door/window schedule.
 - i. Address of the building, the name and address of the owner(s), and of the person(s) preparing the plans.

2. Plans shall be quality blue or black ink line drawings with uniform light background color 24"x 30" in size stamped, and signed by the responsible architect or engineer designing the project.
3. Building design shall comply with construction codes adopted by the City of Long Beach: 2001 edition of the California Building Code, California Mechanical Code, California Plumbing Code, California Electrical Code and Title 18 of the Long Beach Municipal Code (LBMC).
4. Where the fire-resistive covering on columns is exposed to injury from moving vehicles, columns shall be protected in an approved manner [704.2.5].
5. Projections beyond the exterior wall where openings are permitted shall be [705]:
 - a. Non-combustible materials for Type I or II buildings.
 - b. Combustible materials of one-hour construction for Types III, IV or V.
6. Provide/detail fire blocking on buildings of combustible construction. Fire blocking shall be provided in the following locations [708.2.1]:
 - a. In concealed spaces of stud walls and partitions, including furred spaces, at the ceiling and floor levels and at 10' intervals both vertical and horizontal.
 - b. At all interconnections between concealed vertical and horizontal spaces such as at soffits, drop and cove ceilings.
 - c. In concealed spaces between stair stringers at the top and bottom of the run and between studs along and in line with the run of the stairs if the walls under the stairs are unfinished.
 - d. In openings around vents, pipes, ducts, chimneys, fireplaces and similar openings that afford a passage for fire at ceiling and floor levels.
 - e. At openings between attic spaces and chimney chases for factory-built chimneys.
7. Draft stops shall be installed in floor-ceiling assemblies so that the area of the concealed space does not exceed 1,000 square feet and the horizontal dimension between stops does not exceed 60' [708.3.1.1.3].
8. Draft stops shall be installed in attics, mansards, overhangs and similar concealed spaces so that the area between draft stops does not exceed 3,000 square feet and the greatest horizontal dimension does not exceed 60' [708.3.1.2.2].
9. In fire-resistive exterior wall construction, the fire-resistive rating shall be maintained through attic or other concealed spaces. [709.3.1].
10. Parapets shall be provided on all exterior walls of buildings and shall have the same degree of fire resistance required for the wall upon which they are erected. The height of the parapet shall not be less than 30" [709.4.1, 709.4.2].
11. Openings into a shaft enclosure shall be protected by a self-closing fire assembly conforming to Section 713 and having a fire-protection rating of one-hour for openings through one-hour fire-resistive walls and one and one-half hours for openings through two-hour fire-resistive walls [T-6A, 711.1, 711.4].
12. Shaft enclosures shall extend from the lowest floor opening through successive floor openings and shall be enclosed at the top and bottom [711.2].
13. In other than Group I Occupancies, openings that penetrate only one floor and are not connected with openings communicating with other stories or basements need not be enclosed [711.3].
14. Rubbish and linen chutes shall terminate in rooms separated from the remainder of the building by an occupancy separation having the same fire resistance as required for the shaft enclosure. Openings into chutes and chute termination rooms shall not be located in corridors or stairways [711.5].
15. Usable space under the first story shall be enclosed, and such enclosure when constructed of metal or wood, shall be protected on the side of the usable space as required for one-hour fire resistive construction [712].
16. Smoke dampers shall be installed in the following locations: (show dampers on the mechanical plans) [713.10]:
 - a. Penetrations through area or occupancy separation walls.
 - b. Penetrations of shaft enclosures.
 - c. Penetration of fire resistive construction of corridor or horizontal exit walls.
 - d. Penetration of smoke barriers.
 - e. Penetration of elevator lobbies required by Section 403.7 or 1004.3.4.5.
 - f. Penetration of areas of refuge.
17. Fire dampers shall be provided in the following locations: (show dampers on the mechanical plans) [713.11]:

- a. Penetrations through area or occupancy separation walls.
 - b. Penetrations of fire resistive construction of corridor or horizontal exit walls.
 - c. Penetration of shaft enclosures.
 - d. Penetrations of the ceiling of fire resistive floor-ceiling or roof-ceiling assemblies.
 - e. Penetrations of an atrium enclosure element.
 - f. Penetration of the building exterior required to have protected openings by Section 503.
 - g. Penetration of areas of refuge.
18. Openings in smoke barriers shall be protected by self-closing devices or automatic-closing devices actuated by the required controls for the mechanical smoke-control system [905.2.4].
 19. Smoke-control systems shall be supplied with both, a primary power (from the normal building power system) and a secondary power (from an approved standby source). The standby power source and its transfer switches shall be in a separate room from the normal power transformers and switchgear and shall be enclosed in a room of not less than one-hour fire-resistive construction [905.8.1].
 20. Parking garages shall have an unobstructed headroom clearance of not less than 7' above the finish floor to any ceiling, beams, pipes, mechanical ducts or similar obstructions [311.2.3.3].
 21. Through penetrations of walls, where openings are required to be protected, shall comply with Section 709.6.2 or 709.6.3 [709.6.1].
 22. A minimum 0.019 " (No 26 galvanized sheet gage) corrosion-resistant weep screed shall be provided at or below the foundation plate line on all exterior stud walls. The screed shall be placed a minimum of 4" above grade, or 2" above paved areas [2506.5].
 23. Anchored veneer and its attachments shall be designed to resist a horizontal force equal to at least twice the weight of the veneer [1403.4.3].
 24. Anchored veneers shall be supported on footings, foundations or other noncombustible support [1403.6.2].
 25. Planter boxes installed adjacent to wood frame shall have a 2" wide air space between the planter and the building wall [2306.8].
 26. Foundation walls enclosing a basement below finished grade shall be damp proofed outside by approved methods and material [1402.4].
 27. In buildings other than Type I construction, penthouses or other roof structures shall not exceed 28' in height above the roof surface [1511].
 28. The aggregate area of all penthouses and other roof structures shall not exceed $33^{1/3}$ % of the area of the supporting roof [1511.2].
 29. No penthouse or any other projection above the roof shall be used for purposes other than shelter of mechanical equipment [1511.4].
 30. A minimum attic access opening of 22" x 30" shall be provided to attics of buildings with combustible ceiling or roof construction. Opening shall be located in a corridor, hallway or other readily accessible location [1505.1].
 31. Enclosed attics shall have cross ventilation for attic space by ventilating openings. The net ventilating area shall not be less than 1/150 of the area of the ventilated space [1505.3].
 32. Roof drains shall be installed at each low point of the roof [1506.2].
 33. Overflow drains having the same size as the roof drains shall be installed with the inlet flow line 2" above the low point of the roof. Overflow drains shall not be connected to the roof drain lines [1506.3].
 34. Mezzanine shall comply with area limitations, extent of enclosure and exit requirements of [507].
 35. A smoke-control system meeting the requirements of Section 905 shall be provided within the atrium and areas open to the atrium. Atria shall be separated from adjacent spaces by not less than one-hour fire resistive construction [402.2, 402.3, 905.9].
 - a. Openings in the atrium enclosure (other than fixed glazing) shall be smoke-and draft-control assemblies per Section 1004.3.4.3.2.
 - b. Fixed glazed openings in the atrium shall be of not less than three-fourths fire rated and limited to 25% of the area of the common wall between the atrium and the room into which the opening is provided.
 36. Elevator shaft(s) extending more than two floor levels shall be vented to the outside [3004].
 37. Unenclosed floor and roof openings, open and glazed sides of stairways, landings and ramps, balconies or porches, which are more than 30" above grade, or floor below and roofs used for

other than service of the building shall be protected by a guardrail. Guardrails shall be not less than 42" in height [509.1, 509.2].

38. Open guardrails shall have intermediate rails or an ornamental pattern such that a sphere 4" in diameter cannot pass through [509.3].
39. Existing foundations that may be affected by excavations shall be protected against settlement and lateral movement. Before commencing the excavation, the person making the excavation shall notify in writing the owners of the adjoining buildings not less than 10 days before excavation starts. Submit to the Department of Planning & Building (prior to issuance of permit) evidence of adjoining property owner(s) written notification and provide plans for temporary shoring [3301.1, 3301.2].

INTERIOR ENVIRONMENT

1. All occupied portions of a building shall be provided with exterior openings for natural light (1/10 of floor area), or artificial light [1202.1].
2. All occupied portions of a building shall be provided with exterior openings for natural ventilation (1/20 of floor area) or a mechanical system [1202.2.1].
3. Water closets shall be located in a clear space not less than 30" in width. The clear space in front of the water closet shall not be less than 24" [2904].
4. Toilet room floors shall have a smooth, hard nonabsorbent surface such as concrete or ceramic tile or other approved material [807.1.1].
5. Walls within 2' of the front and sides of urinals and water closets shall have a smooth, hard nonabsorbent surface such as concrete or ceramic tile to a height of 4' [807.1.2].
6. The maximum flame-spread class of finish materials used on interior walls and ceiling finish shall not exceed that set forth in Table 8-B [804.1].

SPECIAL HAZARD REQUIREMENTS

1. The walls and soffit of enclosed space in an interior stairway shall be protected on the enclosed side as required for one-hour fire resistive construction [1003.3.3.9].
2. An automatic sprinkler system shall be installed at the top of rubbish and linen chutes and in their

terminal rooms. Chutes extending through three or more floors shall have additional sprinkler heads installed within such chutes at alternate floors [904.2.2].

3. An automatic sprinkler system shall be installed in every story or basement exceeding 1,500 square feet in area unless exterior unobstructed openings are provided for fire department access [904.2.2].
4. An automatic fire sprinkler shall be installed in Group F woodworking occupancies over 2,500 square feet in area [904.2.5].
5. An automatic sprinkler system shall be installed in rooms classified as M Occupancies where the floor area exceeds 12,000 square feet [904.2.8].
6. Standpipes shall be provided as set forth in Table 9-A [904.5.2].
7. For the purpose of glazing, the following shall be considered hazardous locations [2406.4]:
 - a. Glazing in ingress and egress doors.
 - b. Glazing in fixed and sliding panels of sliding doors and panels in swinging doors.
 - c. Glazing within 2' vertical edge of closed door and within 5' of walking surface.
 - d. Glazing in railings and stair landings.

MEANS OF EGRESS

1. Every required exit doorway serving an occupant load of 10 or more shall not be less than 3'-0" wide x 6'-8" high [1003.3.1.3].
2. Regardless of the occupant load served, there shall be a level landing or floor on each side of the door [1003.3.1.6].
3. Exit door(s) shall swing in the direction of exit where the area served has an occupant load of 50 or more [1003.3.1.5].
4. Elevators or escalators shall not be used as a required means of egress component [1003.2.7].
5. Double acting doors shall not be used as exits where any of the following conditions exist [1003.3.1.5]:
 - a. The occupant load served by the door is 100 or more.
 - b. The door is part of a fire assembly.
 - c. The door is part of a smoke-and draft-control assembly.
 - d. Panic hardware is required or provided on the door.

6. Landings shall have a width not less than the width of the door or the stair served (whichever is greater). Doors fully open shall not reduce the width of the landing by more than 7" [1003.3.1.7].
7. Stairs shall meet the following requirements:
 - a. Minimum 11" run & maximum 7" rise. The largest rise or run in a flight of stairs may not exceed the smallest by more than 3/8" [1003.3.3.3].
 - b. Provide a minimum of 6'8" headroom clearance at tread nosing [1003.3.3.4].
 - c. Provide a floor or landing at the top and bottom of each stairway. Landing shall have a dimension in the direction of travel of not less than the width of the stairway. Such dimension need not exceed 44" [1003.3.3.5].
 - d. Provide handrail for the length of the stairs (required for 4 or more risers). The top of the handrail shall be placed not less than 34" not more than 38" above tread nosing [1003.3.3.6].
 - e. Minimum of 44" clear width [1003.3.3.2].
 - f. Handgrip portion of handrail shall be not less than 1-1/4" or more than 2" in cross-sectional dimension having a smooth surface with no sharp corners [1003.3.3.6].
 - g. Positive stair connection to the primary structure without using toe nails or nails subject to withdrawal [2320.13].
8. Buildings four or more stories in height are required to have one stairway extended to the roof unless the roof has a slope steeper than 4 to 12 [1003.3.3.11].
9. Stairway identification signs shall be located at each floor level in all enclosed stairways in buildings four or more stories in height [1003.3.3.13].
10. Tactile stair level identification signs shall be located at each floor level landing in all enclosed stairways in buildings two or more stories in height [1003.3.3.13.1].
11. Exit signs shall be readily visible to clearly indicate the direction of egress travel. No point shall be more than 100' from the nearest visible sign [1003.2.8.2].
12. Exit signs shall comply with lettering design and internal or external illumination requirements [1003.2.8.3, 1003.2.8.4, 1003.2.8.5].

Exit Access

1. The required access to exits from any portion of a building shall be directly from the space under consideration to an exit or to a corridor that provides direct access to an exit [1004.2.2].
2. Provide two exits from basements and from stories other than the first story [1004.2.3.2].
3. A minimum exit separation of one half of the length of the maximum overall diagonal dimension of the area served measured in a straight line shall be provided between required exits [1004.2.4].
4. The travel distance to at least one exit shall not exceed 200' for non-sprinklered buildings and 250' for sprinklered buildings [1004.2.5.2.1, 1004.2.5.2.2].
5. The following lists special travel distance for other occupancies [1004.2.5.2]:
 - a. For atria: No more than 100' of the travel distance may be on an open exit-access balcony within the atrium [402.5].
 - b. For malls: No more than 200' from any point within a mall [404.4.5].
 - c. For Group S-4: No more than 300' in a building without an automatic sprinkler system throughout, and 400' in a building equipped with automatic sprinkler system throughout [1004.2.5.2.4].
6. Aisles shall be provided from all occupied portions of the exit access that contain seats, tables, furnishings, displays and similar fixtures or equipment [1004.3.2.1].
7. In public areas of Groups B and M Occupancies and in assembly occupancies without fixed seats, the minimum clear aisle width shall be 36" where seats, tables, furnishings, displays and similar fixtures are placed on only one side of the aisle and 44" where such fixtures or equipment are placed on both sides of the aisle [1004.3.2.2].
8. The clear aisle width in occupancies with fixed seats shall be based on the number of fixed seats served by such aisle [1004.3.2.3.1]:
 - a. In buildings where smoke-protected assembly seating has been provided and for which an approved life-safety evaluation has been conducted, the aisle width shall be in accordance with Table 10-D.
 - b. In buildings without smoke-protected assembly, the minimum clear aisle width shall be in accordance with Table 10-C.

9. Where seating rows have 14 or less seats, the minimum clear width of access aisles shall not be less than 12" [1004.3.2.3.2].
10. There shall be no more than 100 seats per row served by aisles at both ends [1004.3.2.3.2].
11. Aisles shall terminate at a cross-aisle, vomitory, foyer or doorway. Aisles shall not have a dead end more than 20' in length [1004.3.2.4].
12. Steps shall not be used in aisles having a slope of 1 unit vertical in 8 units horizontal (12.5%) or less [1004.3.2.5.1].
13. Hallways may be used as an exit access component. Hallways serving an occupant load of more than 50 shall not be less than 44" [1004.3.3.2].
14. Corridors serving an occupant load of more than 50 shall not be less than 44". Doors, when fully open, and handrails shall not reduce the required width by more than 7". Doors in any position shall not reduce the required width by more than one half of the required corridor width [1004.3.4.2].
15. Corridor walls shall be constructed of materials approved for one-hour fire-resistive construction [1004.3.4.3, 1004.3.4.3.1].
16. All exit-access doorways in corridor walls shall be protected by tight-fitting smoke-and draft-control assemblies having a fire-protection rating of not less than 20 minutes. Windows in corridors walls shall be protected by at least three-fourths hour fire-rating fixed glazing [1004.3.4.3.2.1, 1004.3.4.3.2.3].
17. Elevators opening into a corridor shall be provided with an elevator lobby at each floor containing such a corridor. The lobby shall completely separate the elevator from the corridor [1004.3.4.5].
3. Exit enclosures shall be of the following fire-resistive construction [1005.3.3.2]:
 - a. In buildings other than Type I or Type II-F.R. construction and less than four stories in height, exit enclosures shall not be less than one-hour fire-resistive construction.
 - b. In buildings of Type I or Type II-F.R. construction of any height, exit enclosures shall not be less than two-hour fire-resistive construction.
 - c. In buildings of any type of construction and four or more stories in height, exit enclosures shall not be less than two-hour fire-resistive construction.
4. Exit enclosure shall exit directly to the exterior of the building or shall include an exit passageway on the ground floor leading from the exit enclosure directly to the exterior of the building [1005.3.3.3].
5. Openings in an exit enclosure shall be limited to those necessary for egress from normally occupied spaces into the enclosure and those necessary for egress from the enclosure [1005.3.3.5].
6. All interior exit doors in an exit enclosure shall be protected by a fire assembly having a fire-protection rating of not less than one-hour in a one-hour exit enclosure and one and one-half hours in a two-hour exit enclosure. Exit doors shall be self-closing or shall automatic close by actuation of a smoke detector [1005.3.3.5].
7. There shall not be enclosed usable space under stairways or ramps in an exit enclosure [1005.3.3.6].
8. In buildings having a floor level used for human occupancy located more than 75' above the lowest level of fire department vehicle access, all exit enclosures shall be pressurized [1005.3.3.7].
9. The width of exit passageways shall not be less than 44" when serving an occupant load of more than 50 [1005.3.4.2].

Exits

1. Intervening rooms shall not interrupt required exits [1005.2.3].
2. In general, once a given level of fire-resistive protection is achieved in an exit component, the fire-resistive time-period of such component shall not be reduced until arrival at the exit discharge or the public way [1005.3.1].
10. Walls, floors and ceiling of exit passageways less than 400' in length shall not be less than one-hour fire-resistive construction [1005.3.4.3].
11. Openings into exit passageways shall be limited to those necessary for egress from normally occupied spaces into the exit passageway and those necessary for egress from the exit passageway [1005.3.4.4].

12. Horizontal exit walls shall be constructed as required for an occupancy separation wall having a fire-resistive rating of not less than two-hours [1005.3.5.2].

Exit Discharge

1. Exterior exit balconies, exterior stairways and exterior exit ramps shall not be located in areas where building openings are prohibited or openings are required to be protected by Table 5-A [1006.2.1].
2. The width of exterior exit balconies serving an occupant load of more than 50 shall be not less than 44" in width [1006.3.2.2].
3. There shall be no enclosed usable space under exterior exit stairways [1006.3.3.2].
4. All openings in the exterior wall below and within 10' measured horizontally of an exterior exit stairway serving a building over two stories in height shall be protected by fixed or self-closing fire assemblies having a three-fourths-hour fire-protection rating [1006.3.3.3].
5. The width of exit courts shall be not less than 44" [1006.3.5.2].
6. Where an exit court having an occupant load of 10 or more is less than 10' in width, the exit court wall shall be not less than one-hour fire-resistive construction for a distance of 10' above the floor of the court, and all openings therein shall be protected by fixed or self-closing fire assemblies having a three-fourths-hour fire-protection rating [1006.3.5.3].

ADDITIONAL MEANS OF EGRESS REQUIREMENTS FOR GROUP A OCCUPANCIES

1. Group A, Division 1,2 and 2.1 occupancies shall be provided with a main exit. The main exit shall be of sufficient width to accommodate not less than one half of the total occupant load [1007.2.1].
2. Auditoriums, theaters and similar assembly rooms of Group A1, A2 or A2.1 occupancies shall be provided with exits on each side. The exits on each side shall be of sufficient width to accommodate not less than one third of the total occupant load served [1007.2.2].
3. Balconies, mezzanines and similar areas having an occupant load of 10 or more shall be provided with access to a minimum of two exits [1007.2.3].

4. The main exit from a multi theater complex shall be of sufficient width to accommodate one half of the total occupant load of the complex [1007.2.4].
5. Exit and exit access doors shall not be provided with a latch or lock unless it is panic hardware [1007.2.5].
6. Buildings housing Group A Occupancies shall front directly to a public street or an exit discharge not less than 20' in width [303.3].
7. An approved alarm system shall be installed in Groups A-1, A-2, and A-2.1 Occupancies [303.9].
8. In Group A Occupancy, an automatic sprinkler system shall be installed in:
 - a. Basements classified as Group A Occupancy when the basement is larger than 1,500 square feet in floor area [904.2.3.2].
 - b. Exhibition and display rooms of more than 12,000 square feet in area [904.2.3.3].
 - c. In enclosed usable space below or over a stairway [904.2.3.4].
 - d. In every building containing a multi theater complex [704.2.3.5].
 - e. In all amusement buildings [904.2.3.6].
 - f. In all stages [904.2.3.7].
9. Any assembly room without fixed seats shall have the capacity of the room posted in a conspicuous location 1007.2.6].
10. In addition to exit and directional signs required by Section 1003.2.8, approved low-level exit signs that are internally or externally illuminated or self-luminous shall be provided [1007.2.7].

ADDITIONAL MEANS OF EGRESS REQUIREMENTS FOR GROUP E OCCUPANCIES

1. All buildings housing Group E Occupancies shall front directly on a public street not less than 20' in width [305.3].
2. Laboratories, vocational shops and similar areas containing hazardous materials shall be separated from each other and other portions of the building by not less than one-hour fire-resistive occupancy separation [305.2.4].
3. An approved alarm system shall be provided for Group E Occupancies with an occupant load of 50 or more [305.9].

4. An automatic sprinkler system shall be installed throughout all buildings containing Group E-1 Occupancies [904.2.4.1].
5. Every room with an occupant load of 300 or more shall have one of its exits or exit-access doorways lead directly into a separate means of egress system. No more than two required exits or exit-access doorways shall enter into the same means of egress system [1007.3.2].
6. The travel distance from any point in a room shall not exceed 75' to a corridor or an exit [1007.3.3.1].
7. In buildings not equipped with an automatic sprinkler system throughout, the travel distance shall not exceed 150' [1007.3.3.2].
8. The path of exit travel shall not pass through laboratories using hazardous materials, industrial shops or other similar places [1007.3.4].
9. The width of hallways and corridors in Group E-1 Occupancies shall be determined as specified in Section 1003.2.3 plus 2', but shall not be less than 6' [1007.3.5].
10. Laboratories having a floor area of 200 square feet or more shall have access to not less than two separate exits. All portions of such laboratories shall be within 75' of an exit or exit access door [1007.3.8].
11. Exit stairway from a basement shall open directly to the exterior of the building without entering the first floor [1007.3.9].
12. Where exit signs are required, additional approved internally or externally illuminated low-level exit signs shall be provided in all rated corridors [1007.3.12].

ADDITIONAL MEANS OF EGRESS REQUIREMENTS FOR GROUP H OCCUPANCIES

1. Every portion of a Group H Occupancy having a floor area of 200 square feet or more shall have access to not less than two separate exits [1007.4.1].
2. The travel distance from any room within Group H-1, H-2, H-3 and H-8 Occupancies shall not be more than 75' of an exit [1007.4.2.1].
3. Corridor doors shall be protected by a fire assembly having a fire-protection rating of not less

than three-fourths-hour with smoke gasketing [1007.4.3].

4. All exit and exit-access doors serving hazardous occupancies shall swing in the direction of exit travel regardless of the occupant load served [1007.4.4].
5. An automatic sprinkler system shall be installed in H-1, H-1, H-3 and H-7 Group Occupancies [904.2.6.1].
6. An automatic sprinkler system shall be installed in H-4 Group Occupancies with a floor area of more than 3,000 square feet [904.2.6.2].

ADDITIONAL MEANS OF EGRESS REQUIREMENTS FOR GROUP I OCCUPANCIES

1. All portions of Group I-1.1 or I-3 Occupancies shall be within 200' of an exit [1007.5.2].
2. Hallways in Group I Occupancies serving an occupant load of 7 or more shall comply with requirements of Sections 1004.3.4 and 1007.5.4 for corridors. Hallways serving any area caring for one or more non-ambulatory persons shall be not less than 8' wide [1007.5.3].
3. Corridors serving any area caring for one or more non-ambulatory persons shall not be less than 8' wide [1007.5.4].
4. All rooms below grade shall have not less than one exit that leads directly to the exterior at grade level [1007.5.6].
5. Exit and exit access doors serving an area having an occupant load of 50 or more shall not be provided with a latch or lock unless it is panic hardware [1007.5.8].
6. A group of rooms in a Group I-1.1, I-1.2 or I-2 may be considered a suite when it complies with the following [1007.5.9.1]:
 - a. Suites or rooms, other than suites containing patient sleeping rooms, shall not exceed 10,000 square feet in area. Suites containing patient sleeping rooms shall not exceed 5,000 square feet in area.
 - b. Each suite of rooms shall be separated from the remainder of the building by not less than a one-hour fire-resistive occupancy separation.
 - c. Each patient sleeping room in the suite shall be so located to permit direct and constant visual supervision by the facility staff.

- d. Exiting for portions of the building outside a suite shall not require passage through the suite.
- 7. In Group I-1.1 Occupancies, every patient sleeping room or treatment room shall have an exit access door leading directly to an exit corridor [1007.5.10].
- 8. Entrance doors to patient's bedrooms from corridors of Group I-1.1 and I-1.2 Occupancies shall not swing into the required width of corridors [1007.5.11].
- 9. In addition to the exit sign requirements of Section 1003.2.8.2, approved low-level internally or externally illuminated exit signs shall be provided in all corridors of Group I Occupancies [1007.5.13].

SPECIAL LOCAL REQUIREMENTS

Storm Water Management

- 1. Plans shall include all required Standard Urban Storm water Mitigation plan (SUSMP) mitigation features such as catch basins, filters.
- 2. A maintenance report of permanent Best Management Practices (BMP) shall be submitted to the City.
- 3. A copy of the recorded "Maintenance Agreement" recorded against the title of the property shall be submitted to the City. The maintenance agreement shall include a signed statement by the developer accepting responsibility for all structural and treatment control BMP maintenance until the time the property ownership is transferred.
- 4. The Maintenance Agreement shall indicate:
 - a. Compliance with all applicable requirements of the BMP.
 - b. A plan to insure ongoing maintenance for permanent BMPs.
- 5. The complete SUSMP requirements may be viewed in the City's website at <http://www.longbeach.gov/apps/cityclerk/lbmc/title-18/frame.htm> and scrolling down to Chapter 18.95

Flood Hazard Zone

- 1. Projects located in a Flood Hazard Zone require that a Flood Elevation Certificate (FEC) be obtained from the Department of public works 10th floor of City Hall [LBMC 21.62].

- 2. Plans shall indicate the finish floor elevation of the lowest floor. The finish floor elevation of the lowest floor, including basement, shall be at or above the Base Flood Elevation (BFE) as indicated on the FEC form. All wood material below the BFE shall be pressure-treated.
- 3. In addition to an Elevation Certificate, a Flood Proofing Certificate must be completed and filed with the City.
- 4. Mechanical, electrical, plumbing service systems shall be located above the BFE or plans shall clearly indicate how system components are protected during flooding.

Earthquake Fault Zone

- 1. Projects located in the Alquist/Priolo Special Studies Earthquake Fault Zone require the submittal of 3 copies of a geological report for review and approval.
- 2. Projects located in a Seismic Hazard Zone as defined by the California State Geologist require the submittal of two copies of a geotechnical report prepared by a California licensed civil or geotechnical engineer having competence in the field of liquefaction evaluation and mitigating measures [106.3.2, 1804.1].

Methane Zone

- 1. Soil report for the project shall include evaluation of methane gas presence on the site.
- 2. Permits shall not be issued for projects within 1,000 feet of fills containing rubbish or other decomposable material unless the fill is isolated by approved natural or manmade protective systems or unless designed according to the recommendations contained in a report prepared by a licensed civil engineer [LBMC 18.12.053].
- 3. All buildings located in a methane zone shall comply with the City of Long Beach Methane Mitigation Standards Policy.
- 4. Depending on the concentration and pressure of methane gas present at the site, prescribe an adequate mitigating system to impede gas intrusion.
- 5. When methane gas intrusion is found, the soil report shall include:

- a. Proposed site tests to determine the concentration and pressure of subsurface methane gas.
 - b. Proposed system to mitigate gas intrusion.
- Site testing shall be conducted under the supervision of a licensed architect, registered engineer or geologist.
6. Building permits for projects located within 1,000' of fills containing rubbish or other decomposable materials, shall not be issued unless the fill is isolated by approved natural or manmade protective systems or unless designed according to the recommendations contained in a report prepared by a California licensed civil engineer [LBM 18.12.053].

STRUCTURAL PLANS

1. The final structural plans must be signed by an engineer or architect licensed by the State of California. Plans for elements of the structure designed by others must be reviewed and signed by engineer or architect of record [106.3.2].
2. Plans shall include complete material specifications [106.3.2].
 - a. Plywood diaphragms: PS 1-95, Douglas Fir Larch, Structural 1 (or CDX).
 - b. Particleboard: ANSI A208.1-1989. Moisture protection is required.
 - c. Wood framing members: Grade and species of all lumber.
 - d. Glue Lam Beams: Identify grade symbol and lamination species per T 5-A, '97 NDS Supp.
 - e. Steel: Structural steel ASTM A36, Structural Pipe ASTM A53 Grade B, Tubing ASTM A 501, Reinforcing bars ASTM A615.
 - f. Concrete: Standard 2500psi concrete. 3,000 psi min. for grade beams and caissons.
3. Structural plans shall include:
 - a. Type of construction, number of stories and building height.
 - b. Design dead and live loads for exits, each floor and roof.
 - c. Seismic coefficients (Z, I, C, R, Na, Cp etc.)
 - d. Basic wind speed, wind pressure coefficients (Ce, Cq, lw etc.)
 - e. Soil type and properties.
4. Notes and details not applicable to the project shall not be included.
5. Structural observation is required. Plans shall include complete notes and clearly indicate stages of construction and items where structural observation is required [1702, LBM 18.24.300].
6. Special inspection is required during the welding of special moment-resisting steel frames. Nondestructive testing per Section 1703 is required [LBM 18.24.280].
7. The seismic design, fabrication and erection of structural steel buildings shall be in accordance with the Seismic Provisions for Steel Buildings, April 15, 1997, published by the American Institute of Steel Construction (AISC). The adoption of the AISC includes Part I (LRFD), Part III (ASD) and Supplement No. 2 dated November 10, 2000 [LBM 18.24.400].
8. Foundation plans shall include footing sections showing: Width, thickness, and depth below undisturbed ground surface or engineered compacted fill per approved compaction report [1806.1, 1806.2].
9. Foundations for all buildings where the ground surface slopes more than 1 unit vertical in 10 units horizontal (10%) shall be level or shall be stepped so that both top and bottom of such foundation are level [1806.4].
10. Ties shall interconnect individual pile caps and caissons of every structure subjected to seismic forces. Ties shall be capable of resisting, in tension or compression, a minimum horizontal force of 10% of the larger column vertical load [1807.2].
11. Submit Soils/Geotechnical report for review and approval [106.3.2, 1804.1].
12. Building or grading plans shall show the name, address and phone number of the Project Geotechnical Consultant and a list of all applicable geotechnical reports.
13. Grading and foundation plans shall include the following statement: **"Excavations shall be made in compliance with CAL/OSHA regulations."**
14. Foundation plans shall indicate that: **"All foundation excavations must be observed and approved by the Project Geotechnical Consultant prior to placement of reinforcing steel."**
15. The final grading, drainage, shoring and foundation plans shall be reviewed, signed and wet-stamped by the Project Geotechnical Consultant.

16. Hold-down hardware locations shall be shown on foundation plan.
17. Plans shall indicate the type, size, embedment, edge distance, and spacing of all anchor bolts. Minimum anchor bolt diameter of 5/8" with 7" embedment is required [1806.6].
18. Specify plate washers for all anchor bolts [LBMC 18.24.510].
19. Hold-down connectors shall be re-tightened just prior to enclosure [LBMC 18.24.470].
20. Foundation shall be extended a minimum of 6" above adjacent finish grade/surface [2306.8].
21. The deflection in the plane of the diaphragm shall not exceed the permissible deflection of the attached elements [1633.2.9, LBMC 18.24.230].
22. Diaphragms supporting concrete or masonry walls shall have continuous ties between diaphragm chords to distribute the anchorage forces specified in Section 1633.2.8. The spacing of continuous ties shall not exceed 25" [LBMC 18.24.260].
23. The maximum allowable diaphragm shear used to determine the depth of the sub diaphragm shall not exceed 300 plf. The maximum length-to-width ratio of the wood sub diaphragm shall be 2-1/2 to 1 [LBMC 18.24.260].
24. Plywood thickness, grade, span, panel index, nailing schedule and panel layout for roof and floor diaphragms shall be specified [T23-II-E-1, T23-II-E-2, T23-II-F-1].
25. Framing plans shall include complete design/details of truss system (s).
26. Positive connections at all post-beam connections to account for uplift forces and lateral displacements shall be specified [2314].
27. Studs supporting two floors and a roof must be framed of 3"x 4" or 2"x 6" members [T23-IV-B].
28. Aspect ratio of plywood shear walls shall be limited to 2:1 [LBMC 18.24.440, T23-II-G].
29. Plans shall provide a shear wall schedule including the maximum design shear load for each shear wall type [T23-II-I-1, LBMC 18.24.520].
30. For all shear walls with a shear value greater than 350 plf, the following shall be provided: [T 23-II-I-1].
 - a. 3 x foundation sill plates.
 - b. 3 x framing members receiving edge nailing from abutting panels.
 - c. Diaphragms and shear wall nailing shall utilize common or galvanized box nails.
 - d. 1/2" edge distance for plywood boundary nailing.
31. Live load used in the design of each floor of an industrial building shall be conspicuously posted in each room [1607.3.5].

STRUCTURAL CALCULATIONS

1. Provisions shall be made for the special vertical and lateral loads as set forth in Table 16-B [1607.3.4].
2. Concrete and masonry walls shall be anchored to all floors and roof. Such anchorage shall provide a positive direct connection capable of resisting induced horizontal forces but not less than the minimum forces per Section 1611.4 [1605.2.3].
3. Interior walls, permanent and temporary partitions that exceed 6' in height shall be designed to resist all loads to which they are subjected but not less than a load of 5 pounds per square foot applied perpendicular to the walls [1611.5].
4. All roofs shall be designed with sufficient slope to ensure adequate drainage after the long-term deflection from dead load or shall be designed to resist ponding load [1611.7].
5. All foundations and slabs subjected to water pressure shall be designed to resist a uniformly distributed uplift load equal to the full hydrostatic pressure [1611.8].
6. Buildings and all portions thereof shall be designed to resist the following load combinations [1612.1, 1630.1.1]:
 - a. Strength Design or Load and Resistance Design [1612.2].
 - b. Allowable Stress Design [1612.3].
 - c. Special Seismic Loads [1612.4].
7. The deflection of any structural roof member shall not exceed the values set forth in Table 16-D, based on the factors set forth in Table 16-E [1613].
8. Design wind pressures for buildings and elements therein shall be determined in accordance with the following formula: $P = C_e C_q q_s I_w$ [1620].
9. The base overturning moment for the entire structure, or for any one of its individual primary

- lateral-resisting elements, shall not exceed two thirds of the dead-load resisting moment [1621].
10. The resulting member forces, moments and the story drifts induced by $P\Delta$ effects shall be considered in the evaluation of overall structural frame stability and shall be evaluated using the forces producing the displacements of Δ_s [1630.1.3].
 11. The base shear of structures conforming to the requirements of Section 1629.8.2 may be calculated by the simplified design method [1630.2.3.2].
 12. The seismic amplification factor Ω shown on Table 16-N applies to the Allowable Stress and Strength Design methods [1630.3.1].
 13. The R-value used in the design of any story shall be less than or equal to the R-value used in the given direction for the story above [1630.4.2].
 14. Where a structure has a bearing wall system in only one direction, the R-value used for the design in the orthogonal direction shall not be greater than that used for the bearing wall system [1630.4.3].
 15. Structural calculations to justify the adequacy of the structural system in resisting seismic, wind and gravity loads shall be provided [1615, 1626].
 16. Exit facilities shall be designed for 100 pounds per square feet live load. [T16-A].
 17. Railings and its components (including glass railings) shall be designed to withstand minimum horizontal forces per Table 16-B [2406.6].
 18. Ceiling framing shall be designed for a live load of 10 psf. [T 16-B].
 19. Retaining walls shall be designed to resist at least 1.5 times the induced lateral force and 1.5 the induced overturning moment, using allowable stress design loads [1611.6].
 20. Height/length ratio of plywood shear walls shall be limited to 2:1. Complete calculations (including deflections) and details where straps are used at openings to reduce the effective height of shear wall shall be provided [2315.1, LBMC 18.24.440].
 21. Calculations and details for chord splices shall be provided.
 22. Calculations and details for drag struts between shear walls shall be provided.
 23. Shear transfer from the roof diaphragm or upper shear wall to shear wall below shall be provided. Detail nails, bolts, shear plates, sill plates and blocking if required.
 24. When determining the maximum uplift force for hold-down design, multiply the dead load resisting moment by 0.9 for seismic forces or 2/3 DL for wind forces. [1612.3.1, 1621.1].
 25. Cantilevered columns resisting seismic forces shall be designed with an R factor of 2.2 with an Over strength Factor Ω of 2 and a maximum story drift Δ_M of 0.025h. [T 16-N, 1630.10.2].
 26. Story drift shall be computed using the Maximum Inelastic response Displacement, Δ_M [1630.10].
 27. In masonry or concrete buildings, structural panel diaphragms shall not be considered as transmitting lateral forces by rotation [2315.1].
 28. Cantilevered diaphragms supporting floors or roof shall not exceed 15% of the distance between lines of lateral-load resisting elements from which the diaphragm cantilevers. The depth to width ratio of the cantilevered diaphragm shall not be less than 4:1 [LBMC 18.24.440].
 29. The design story shear V_x shall be distributed to the various elements of the vertical lateral-force resisting system in proportion to their rigidities, considering the rigidity of the diaphragm [1630.6].
 30. Limit the allowable non-cyclic shear values of Table 23-II-1, to 75% of values shown to account for stress losses due to seismic loads [LBMC 18.24.520].
 31. The ductility factor R for ordinary moment-resisting frame is limited to 4.5 and the seismic amplification factor Ω is limited to 2.8 [Table 16A-N].
 32. Structural steel buildings designed to resist load combinations specified in Section 1612.2 for strength design shall be designed in accordance with Chapter 22 Division II and Part I of the AISC.
 33. Structural steel buildings designed to resist load combinations specified in Section 1612.3 for allowable stress design shall be designed in accordance with Chapter 22 Division III and Part III of AISC.

34. Concrete, masonry, steel and wood elements supporting discontinuous lateral-load resisting systems shall have the design strength to resist the combination loads resulting from the special seismic load combinations of Section 1612.4 [1630.8.2.1].
35. A near source factor N_a of 1.3 in the determination of C_a (within 2 kilometers of a Type B fault) shall be used.
36. Unless the terrain is flat and generally open, wind design within the City shall be based on exposure B requirements.
37. Wood stud walls and bearing partitions shall not support more than two floors and a roof unless an analysis satisfactory to the building official shows that shrinkage of the wood framing will not have adverse effects on the structure or any plumbing, electrical or mechanical system [2308].
38. Masonry shear walls designed using working stress method shall be designed to resist 1.5 times the induced seismic loads [2107.1.7].
39. Concrete or masonry walls shall be anchored to all floors and roofs that provide out-of-plane lateral support of the wall. The anchorage shall provide a positive direct connection [1633.2.8].
40. Out-of-plane wall anchorage to flexible diaphragms providing lateral support for concrete or masonry walls shall be designed as follows [16.33.2.8.1]:
Out-of-plane wall anchorage to flexible diaphragms providing lateral support for concrete or masonry walls shall be designed as follows [16.33.2.8.1]:
 - a. Elements of the wall anchorage shall be designed for the forces specified in Section 1632 where $R_p = 3.0$ and $a_p = 1.5$.
 - b. Account for eccentricity when elements of the wall anchorage are not concentric or are not perpendicular to the wall.
 - c. Consider the additional load transferred from the wall to the pilaster, if pilasters are present.
 - d. The strength design forces for steel elements of the wall anchorage system shall be 1.4 times the required forces.

The strength design forces for wood elements of the wall anchorage system shall be 0.85 times the required forces and these wood elements shall have a minimum actual net thickness of 2-1/2".